
METAPHOR AND THOUGHT

SECOND EDITION

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*Metaphor, language, and thought

ANDREW ORTONY

A central presupposition of our culture is that the description and explanation of physical reality is a respectable and worthwhile enterprise – an enterprise that we call “science.” Science is supposed to be characterized by precision and the absence of ambiguity, and the language of science is assumed to be correspondingly precise and unambiguous – in short, literal. For this reason, literal language has often been thought the most appropriate tool for the objective characterization of reality. For example, in early twentieth-century Western philosophy a tacit belief in the privileged status of literal language was an important underlying assumption of picture theories of meaning (e.g., Russell, 1956; Wittgenstein, 1921/1961). This belief reached a peak in the doctrine of logical positivism, so pervasive amongst philosophers and scientists sixty years ago. A basic notion of positivism was that reality could be precisely described through the medium of language in a manner that was clear, unambiguous, and, in principle, testable – reality could, and should, be literally describable. Other uses of language were meaningless for they violated this empiricist criterion of meaning. During the heyday of logical positivism, literal language reigned supreme.

A different approach is possible, however, an approach in which any truly veridical epistemological access to reality is denied. The central idea of this approach is that cognition is the result of mental *construction*. Knowledge of reality, whether occasioned by perception, language, or memory, necessitates going beyond the information given. It arises through the interaction of that information with the context in which it is presented and with the knower’s preexisting knowledge. This general orientation is the hallmark of the relativist view (E. Sapir, 1921; Whorf, 1956) that the

objective world is not directly accessible but is constructed on the basis of the constraining influences of human knowledge and language. In this kind of view – which provides no basis for a rigid differentiation between scientific language and other kinds – language, perception, and knowledge are inextricably intertwined.

Opposing beliefs along the lines of these two views find their expression in a number of different areas. They can be found in anthropology, in sociology, in linguistics, in cognitive psychology, in epistemology and the philosophy of science, and even in literary theory (e.g., Bartlett, 1932; Berger & Luckmann, 1966; Blumer, 1969; Brooks & Warren, 1938; Chomsky, 1965; Greimas, 1970; Hanson, 1958; Hempel, 1965; Kant, 1787/1963; J. J. Katz, 1966; Lévi-Strauss, 1963; Neisser, 1967; Price, 1950; Sperber, 1975). I shall refer to these opposing conceptions as “constructivism” and “nonconstructivism,” fully recognizing that this terminology is far from ideal. Different scholars subscribe to these opposing beliefs to different degrees, and in different ways. Few subscribe to them in the extreme forms in which I have presented them and few will agree with the labels I attach to them. Nevertheless, it seems useful to attempt to relate two alternative approaches to metaphor – metaphor as an essential characteristic of the creativity of language, and metaphor as deviant and parasitic upon normal usage – to a more fundamental and pervasive difference of opinion about the relationship between language and the world.

The constructivist/nonconstructivist distinction provides an interesting perspective from which to view the essays in this collection. The constructivist approach seems to entail an important role for metaphor in both language and thought, but it also tends to undermine the distinction between the metaphorical and literal. Because, for the constructivist, meaning has to be constructed rather than directly perceived, the meaning of nonliteral uses of language does not constitute a special problem. The use of language is an essentially creative activity, as is its comprehension. Metaphors and other figures of speech may sometimes require a little more creativity than literal language, but the difference is quantitative, not qualitative. By contrast, the nonconstructivist position treats metaphors as rather unimportant, deviant, and parasitic on “normal usage.” If metaphors need explaining at all, their explanation will be in terms of violations of linguistic rules. Metaphors characterize rhetoric, not scientific discourse. They are vague, inessential frills, appropriate for the purposes of politicians and poets, but not for those of scientists because the goal of science is to furnish an accurate (i.e., literal) description of physical reality.

As the various disciplines of human enquiry gained their independence over the centuries, adopting their own domains, techniques, and metalanguages, the study of metaphor survived as a curiosity in some and disappeared as irrelevant in others. There was but one discipline in which the study of metaphor was central – rhetoric. The area of literary theory called

rhetoric was for centuries chiefly concerned with figurative language, especially tropes (see Preminger, 1974, for a detailed account of such troublesome terms as "literature," "rhetoric," "poetics," "figurative language," "trope," etc.). What for others was but an occasional means of communication, for the rhetorician became the principal object of study. Contemporary scholars of literature vary in their theoretical persuasions almost along constructivist/nonconstructivist lines. Some literary theorists, for example, semioticians, challenge the literal/figurative distinction, whereas others, for example, the New Critics and some structuralists, accept it almost without question. Thus, literary scholars vary in the extent to which the study of metaphors and other tropes is central to their enterprise. Even so, until recently, few would have denied that tropes (of which metaphor is the archetype) are in some way special to literature. In many of the chapters that follow, however, it is implied that all language, including scientific language, is tropological. Again, the constructivist approach, with which this conclusion is principally associated, seems to threaten the distinction between the language of the poet and that of the scientist by repudiating the distinction between the metaphorical and the literal on which it is usually based.

Because rhetoric has been a field of human enquiry for over two millennia, it is not surprising that any serious study of metaphor is almost obliged to start with the works of Aristotle. Aristotle was interested in the relationship of metaphor to language and the role of metaphor in communication. His discussion of the issues, principally in the *Poetics* and in the *Rhetoric*, have remained influential to this day. He believed metaphors to be implicit comparisons, based on the principles of analogy, a view that translates into what, in modern terms, is generally called the *comparison* theory of metaphor. As to their use, he believed that it was primarily ornamental. In the *Topica* he argued that it is necessary to be wary of the ambiguity and obscurity inherent in metaphors, which often masquerade as definitions. He urged that a clear distinction be made between genuine definitions and metaphors.

A more contemporary influence on the theoretical study of metaphor was that of Richards (e.g., 1936b). Richards not only proposed a set of useful terms for talking about metaphors (the "topic" or "tenor," the "vehicle," and the "ground"), he also proposed a theory about how they function. This theory, called the "tensive" view, emphasized the conceptual incompatibility, the "tension," between the terms (the topic and the vehicle) in a metaphor.

More recently, there has been a growing interest in metaphor in a number of other disciplines. In linguistics, for example, an increasing concern with linguistic performance and pragmatics (in contrast to the emphasis on linguistic competence so characteristic of the Chomskian revolution), and an increasing interest in the nature of text, have resulted in more attention

being given to nonliteral uses of language. In psychology, especially cognitive psychology, characterizing the processes involved in the comprehension of metaphors is not only an interesting challenge in its own right, but the specification of those processes also constitutes a good test of the power of theories of language comprehension in general. There are other disciplines in which metaphor is of interest, some of which are represented in this book. The chapters that follow deal primarily with a variety of philosophical, linguistic, psychological, and educational issues pertinent to the study of metaphor. Thus, the focus is mainly on metaphor from nonliterary perspectives, not because literary perspectives are unimportant, but because they have been extensively dealt with elsewhere. It is to be hoped that literary theorists will see some virtue in these new disciplinary perspectives on old problems.

The chapters in this book could be organized and classified in many ways. For example, they could be classified on the basis of whether they take a microscopic or macroscopic approach to metaphors. In the microscopic approach, the arguments and analyses tend to be based on examples in which the metaphors (and in some cases other tropes) are of words or (sometimes) sentences. By contrast, the macroscopic approach is more concerned with systems of metaphors, or metaphoric or analogical models (Geertz, 1974). In such cases there may be a sentence level, or "root metaphor" (V. W. Turner, 1974), but the emphasis tends to be on the larger system that emanates from it.

A second, and more fundamental way in which to classify the chapters is in terms of which of two major questions they address, even though these questions are not always addressed explicitly. One of these questions – *What are metaphors?* – has to do with the *nature* of metaphor, and the other – *What are metaphors for?* – is concerned with the *uses* of metaphor. The first question is the primary, but by no means the only concern of the chapters in the first three sections, namely, those on Metaphor and Meaning, Metaphor and Representation, and Metaphor and Understanding. The second question is more central to the last two sections of the book, which deal with Metaphor and Science, and Metaphor and Education.

The issues raised in the first section, Metaphor and Meaning, tend to presuppose that metaphors are primarily *linguistic* phenomena. For the most part, the examples used are of metaphors as words, and the approaches taken are somewhat traditional. The presuppositions that underlie many of these chapters are that metaphors are somehow "deviant," that they need to be explained in terms of "normal" or "literal" uses of language, and that their main function is to provide an alternative linguistic mechanism for expressing ideas – a communicative function. This can be seen clearly in Chapter 2, by Black.

One of Black's purposes is to further develop his *interaction* theory of metaphor, a theory whose origins can be found in the work of Richards

(1936a), but which was first articulated in detail by Black (1962b). Black now seeks to specify the theory in terms that are not themselves metaphorical. He restricts his discussion to metaphors that he considers to be theoretically interesting, “vital” metaphors. In addressing the question of how to distinguish metaphors from other forms of language (the central “What are metaphors?” question), he suggests that any search for an infallible criterion of “metaphorhood” is doomed to failure. Any criterion one cares to suggest, says Black, can be shown to break down under certain circumstances.

Black believes that metaphors sometimes function as “cognitive instruments,” a view that foreshadows Boyd’s on their role in scientific discourse. Just as Boyd argues that some metaphors actually constitute scientific theories, so Black argues that some metaphors permit us to see aspects of reality that they themselves help to constitute. This claim is related to two themes that surface repeatedly throughout the book. The first is the idea that something new is created when a metaphor is understood. The second is that metaphors afford different ways of viewing the world. The question of whether metaphors give rise to something new when they are understood is only partly an empirical question. Clearly, with respect to an individual, new knowledge can result from the comprehension of language in general, and to that extent at least, it can result from the comprehension of metaphors in particular. But whether, for example, metaphors in some special way create new similarities by changes in word meanings, as Black (1962b) implied, depends, as Black now points out, on how one construes notions such as “creating similarities” and “changes in word meanings.” Certainly one can come to see relationships that one did not see before, but whether exclusively by metaphor is doubtful. Certainly, in some sense, the interpretations of some words in metaphors are different from their interpretations in literal contexts, but whether that constitutes a change in word meanings is also doubtful. It is clear, however, that the emergence of “something new” is a pivotal concept in Black’s interaction theory of metaphor. If Black is right, then the idea needs to receive the kind of elaboration that he offers, at least as a first step.

The idea that metaphors afford different ways of perceiving the world is central to the chapters of Schön and of Reddy. Schön proposes that in social contexts, “generative” metaphors may result in a sort of cognitive myopia wherein some aspects of a situation are unwittingly (or not) emphasized at the expense of other, possibly equally important aspects. If one believes that important social problems can be viewed from “correct” and “incorrect” (or “healthy” and “unhealthy”) perspectives (see Geertz, 1974), then the possibility exists that metaphors may sometimes lead to an incorrect (and consequently, a socially harmful or undesirable) view. Schön is concerned with social policy planning, especially urban planning. He describes how society’s ills receive conflicting descriptions, often couched as metaphors. These descriptions, these “stories people tell” carry with

them, often covertly and insidiously, natural “solutions.” Thus the way in which a social situation is viewed constrains the set of problem solutions in a sometimes wrong or inappropriate way. Schön calls this dilemma “frame conflict,” and the solution to it “frame restructuring.” Frame restructuring involves the coordination and reconciliation of the conflicting descriptions. Conflicts of frames, he argues, cannot be resolved by appeal to the facts, because all the “relevant” facts are already embedded in the metaphor. Thus, Schön’s chapter emphasizes the extent to which metaphors can constrain and sometimes dangerously control the way in which we construct the world in which we live. It is a warning to be wary of such “generative” metaphors, metaphors that generate their own solutions, because more often than not they will fail to present an objective characterization of the problem situation.

Reddy, applying Schön’s notion to language itself, argues that the metaphors we use to talk about human communication encourage us to view communication in the wrong way – they encourage us to see it from a nonconstructivist rather than from a constructivist perspective. In talking about English, the metalinguistic resources available and normally used are the result of what he calls the “conduit metaphor.” This metaphor for communication in natural language is based on the idea that language is a *carrier* of ideas, thoughts, aspirations, and so on, so that all a hearer needs to do is to *unpack* the message and *take out* what was *in* it. Reddy argues that the conduit metaphor falsely presupposes a certain objectivity – an objectivity that ignores the contribution of the hearer’s or reader’s own knowledge and experience. He observes that it leads to erroneous attempts to solve various kinds of communication problems, and, one might add, until a few years ago, to erroneous attempts to uncover the psychological processes involved in language comprehension. Reddy’s chapter contains an appendix of examples of the conduit metaphor in action. This appendix is in itself a major piece of work, providing linguistics with an unusual corpus, as well as substantiating Reddy’s claims about the pervasiveness of the root metaphor. The conduit metaphor that Reddy sees as being so misleading, turns out to be isomorphic with the nonconstructivist approach to language and cognition. The alternative analogy that he proposes (the “toolmaker’s paradigm”) is an attempt to sketch a constructivist alternative. Reddy’s main point, however, is fundamentally the same as Schön’s, namely, that the way we talk about things (in Reddy’s case, human communication, and in Schön’s case, social problems) often depends on root metaphors that are essentially misleading and inaccurate.

As we shall see later, toward the end of the book Petrie and Oshlang redress the balance somewhat by arguing that metaphor does not have to be the villain; the alternative ways of seeing that it affords are not only an advantage in educational contexts, but a necessary feature of them.

The constructivist claims of Schön and Reddy find their most thorough

and explicit treatment in Lakoff's chapter. Lakoff, acknowledging his intellectual debt to Reddy, presents a detailed account of a theory of mental representation firmly rooted in the idea that metaphor plays a central role in the way in which we think and talk about the world. Many of our most mundane concepts, such as those of time, states, change, causation, and purpose are, Lakoff argues, represented metaphorically, that is, in terms of other concepts. Lakoff repudiates a number of cherished assumptions that he considers as underlying not only many approaches to metaphor, but more generally entire domains of inquiry – domains such as the philosophy of language, symbolic approaches to artificial intelligence, and information processing psychology.

The macroscopic views of Schön, Reddy, Lakoff, and others contrast quite sharply with some of the more microscopic views. For example, Sternberg, Tourangeau, and Nigro, in their chapter, share most of Schön's conclusions, but they arrive at them from their own microscopic approach. They propose a theory of the processes involved in the generation and comprehension of metaphors, as well as a characterization of the representation of knowledge consistent with the operation of those processes. The basic construct that they employ is that of "semantic feature spaces." The idea is that a good metaphor utilizes regions in two remote conceptual spaces that occupy similar positions within each space. An important issue that they address is that of the "goodness" or "success" of a metaphor which, they claim, depends on maximizing the distance between the different domains (feature spaces) involved, while minimizing the difference between the positions occupied by each term within each domain. This conception of the goodness or "aesthetic pleasingness" of a metaphor they contrast with a notion of the "comprehensibility" of a metaphor, which is enhanced by minimizing the distance between the domains themselves. From this it follows that the better the metaphor, the less comprehensible it is (up to some limit). The analysis that Sternberg et al. offer is consistent with the belief that metaphors are an important means of expressing ideas for which the language may not have any literal terms. This is because, in their view, a function of metaphors can be to identify a point in the topic feature space such that the corresponding point in a different, vehicle, feature space has no lexical items associated with it.

Sadock, Rumelhart, and others raise challenging questions about the distinction between literal and metaphorical meaning, sharing Black's doubts about the possibility of a valid criterion for "metaphorhood." Sadock believes that if linguistics is conceived of in a strict, traditional manner, then the study of metaphor does not constitute a proper part of it because metaphors are features of language use rather than of language per se. He argues that there seems to be no rational basis for distinguishing literal from metaphorical language at all. Where are we to draw the line? Why could it not be argued that the use of the word "lion" to refer to both

the species in general, and male members of that species in particular, is a kind of semantic or metaphorical extension to both? Who is to say which is the “core” meaning, and which is the extended meaning? Even at this simple level, there are questions about how the metaphorical can be distinguished from the literal. Although those, like Searle, who advocate more extreme positions are willing to agree that the notion of literal meaning is not without its problems, still that notion has to be presupposed in order for their accounts to get off the ground.

Rumelhart comes to a similar conclusion from a rather different starting point. His position is that the distinction between metaphorical and literal language does not have any psychological correlate in the underlying processes involved in their comprehension. The processes required to understand the one are the same as those required to understand the other. According to Rumelhart, metaphor plays a crucial role in language acquisition. In applying old words to new objects or situations, children engage in a kind of metaphorical extension. Sometimes these extensions are consistent with conventional uses of the word, and we perceive the child as having learned something more about the word’s applications. Sometimes they are not consistent with conventional uses, and adults, in their wisdom, are quick to attribute an error to the child. Thus, when a child, having first learned to use the word “open” in the context of opening his or her mouth, “correctly” uses the same word in the context of opening a door or a window, he or she is doing exactly the same thing as when “incorrectly” using it in the context of “opening” a light switch or a faucet. In the former case the new use is conventional (in English) whereas in the latter case it is not (but interestingly it is, for example, in French). On this view, metaphor cannot be regarded as some kind of linguistic aberration that requires an extraordinary explanation. Rather, it has to be regarded as an essential ingredient of language acquisition, and consequently a natural and normal linguistic phenomenon. From Rumelhart’s perspective, metaphor is still immensely important, but its role in language is now viewed quite differently. It is viewed from a constructivist position.

The approach advocated by Black is probably not a typical pragmatic account, as is the one proposed by Searle in his chapter. It is pragmatic in its reliance on context, but it does not follow the familiar Gricean tack (see Grice, 1975; Searle, 1969). Both pragmatic accounts, however, are in sharp contrast to the semantic approach advocated by Cohen. For Cohen, metaphors can be accounted for solely within a theory of semantics – itself part of a general theory of language, rather than a theory of language use. Thus, Cohen attempts to characterize the kinds of systematic violations of semantic rules that would be needed to explain the basis of metaphors. In particular, he examines rules that specify the cancellation of semantic features as a means of arriving at metaphorical meaning directly from literal meaning. His chapter is interesting and provocative, representing, as it does, a well

worked out account based on a now unfashionable approach to meaning. Cohen's position is that all that is required to account for metaphors is a set of (essentially) linguistic rules.

On the other hand, Searle sees the fundamentally important question as being much the same as for indirect speech acts, namely, What are the mechanisms whereby a sentence meaning can be related to the speaker's meaning? Searle discusses some candidate mechanisms, including the proposal that the link between the two could be achieved by the hearer "calling to mind" appropriate relating elements. Searle distinguishes metaphors from indirect speech acts by suggesting that whereas in indirect speech acts the speaker intends to convey both the sentence meaning and the indirect meaning, in metaphors the intention can only be to convey the latter. Morgan's chapter questions the power of Searle's notion of "calling to mind." Searle casts the net too wide, Morgan claims. Thus, while generally sympathetic to Searle's approach, Morgan is nevertheless unhappy with the details. Searle argues that if a literal interpretation is rejected, a metaphorical interpretation must be sought. Morgan objects that such an account is too vague because it fails to distinguish between metaphors, mistakes, irony, and a host of other indirect speech acts.

Morgan's call for a need to distinguish the principles underlying different kinds of tropes is answered, albeit indirectly and in different ways, in two of the new chapters included in this second edition, the one by Gibbs, and the one by Winner and Gardner. Gibbs takes as his starting point Lakoff's "Contemporary Theory" and presents some empirical results designed to support the contention that metaphors and various other kinds of tropes are understood effortlessly because experience is conceptualized in the kinds of metaphorical ways that Lakoff describes. Naturally, with this orientation, Gibbs rejects Searle's pragmatic account, based as it is on a sharp distinction between literal and metaphorical uses of language. On the other hand, Winner and Gardner in their chapter accept the distinction between literal and nonliteral language, and offer data from comprehension studies with young children to illuminate the difference between metaphor and irony. In doing so, they examine the relative roles in the understanding process of domain knowledge, metalinguistic knowledge, and children's emerging theories of mind.

A semantic account of metaphor, epitomized by Cohen's chapter, locates metaphors primarily at the level of word meanings, so that augmented metaphorical word meanings contribute to a different sentence meaning. The pragmatic account, exemplified in Searle's chapter, moves up a level and locates metaphors at the level of different uses of sentences by speakers: speaker meaning can be the same as sentence meaning, or it can require a metaphorical reinterpretation of sentence meaning. As we have already seen, however, some authors reject both these accounts, although not necessarily for the same reasons (compare, for example, the reasons of

Rumelhart with those of Lakoff). Glucksberg and Keysar also flatly reject the kind of pragmatic approach advocated by Searle, but their view is also at odds with Lakoff's. Glucksberg and Keysar propose that metaphors are class inclusion statements and are understood as such in the normal course of language comprehension.

Levin, on the other hand, is willing to accept the general thrust of Searle's approach, especially the separation of sentence meaning and speaker meaning – a separation that he sees as being of theoretical utility. Levin argues, however, that the mechanisms whereby metaphors are understood are more complex, and he advances two reasons for believing this. First, he suggests that the metaphorical transfer is artificially made unidirectional by the use of examples that introduce the predicate through the copula (*X is a Y*). This, he says, makes it difficult to conceive of a metaphorical transfer going from *X* to *Y*, rather than from *Y* to *X*. He argues, however, that if we take a sentence like "the brook smiled," we can see there is a choice as to whether to attribute characteristics of smiling to the brook, or characteristics of brooks to smiling. His second reservation is more radical. The kind of approach advocated by Searle, he suggests, may be suited to metaphors that arise in everyday language, but another approach might be more appropriate for literary metaphors. In literary metaphors, linguistic construal – whereby the language is reinterpreted to fit the world – might better be replaced by phenomenalistic construal, wherein a reader's model of the world is changed to accommodate a literal interpretation of the metaphor. This approach, suggests Levin, may provide a better basis for understanding what it is that poets are doing. What is defective, on this account, is not the use of language, but the model of the world that is being built up. The notion of phenomenalistic construal fits rather well with the discussion of the reading process presented by Miller in his chapter – what it requires in literature is a suspension of disbelief, rather than a reinterpretation of the language.

Perhaps the semantic and pragmatic views of metaphor need not be quite so antithetical as their strongest proponents imply. The radical pragmatics position accepts a notion of "literal meaning" (sentence meaning), that is alleged to deviate from the speaker's meaning. It would thus be possible, at least in principle, to conceive of the transformation mechanisms from the one to the other as involving precisely the kinds of rules that the radical semantics position claims are required to account for metaphor. To be sure, the pragmatic approach is going to want more than that, but it is doubtful it can get away with less. Not all positions on this issue are amenable to such a rapprochement, however. Lakoff, Rumelhart, and to a lesser extent Miller, believe that there is no cognitive basis for a sharp distinction between the literal and the nonliteral. Rather, metaphoricity is a dimension along which statements can vary. Rumelhart clearly thinks that no special mechanisms need be postulated to account for the comprehension of metaphors –

neither a pragmatically nor a semantically motivated reinterpretation is required. And if no reinterpretation is required the rules of the radical semanticists would appear to be left without any cognitive counterparts.

The controversy over whether metaphor can be dealt with purely within semantics is a reflection of the broader question: "What are metaphors?" The dispute concerns how metaphors should be categorized – as a purely linguistic phenomenon, as a more general, communication phenomenon, or even more radically, à la Lakoff and Gibbs, as a phenomenon of thought and mental representation. If metaphors can be handled by a purely linguistic theory, there is no need to invoke extralinguistic knowledge to account for them. The extreme alternatives seem to map quite directly onto the nonconstructivist and the constructivist approaches respectively. Black's chapter urges us to consider genuine cases of nontrivial metaphors. But such "naturally occurring" metaphors are frequently incomprehensible if one does not consider the contexts in which they occur. If we have to refer to a context of use in order to know if something is a metaphor, it would seem that a purely semantic account is too restrictive. Such an account cannot accommodate the observations of Black and Searle that in some contexts a speaker may intend to convey both the literal meaning of an utterance and a metaphorical meaning. Furthermore, it cannot even begin to explain that level of the comprehension of metaphors that Black calls "interaction." It is by no means clear, however, that the kind of approach advocated by Searle would be any better suited to the explanation of interaction. Indeed, it could be argued that the three traditional theories of metaphor – the substitution view, the comparison view, and the interaction view – are all equally compatible, or incompatible, with the semantics and the pragmatics approaches. Both approaches seem primarily concerned with the nature of the relationship between metaphor meaning and surface meaning. Of course, Black is not really interested in what particular metaphors mean. As indicated above, he is concerned with giving an account of metaphor that satisfies an intuition that he and many others have, namely, that there is some special, emergent "new thing" that is created when a novel metaphor is understood – something new that is attributable to the metaphor rather than to its novelty.

The emergence of something new is considered by Paivio and Walsh to be one of the central problems surrounding the comprehension of metaphors. They see as a tool for its explanation the notion of integration, whereby disparate elements in the utterance are combined to yield something greater than the sum of their parts. They see the concepts of similarity and relation as also being implicated, and their chapter discusses these three central concepts and their relationship to metaphor. Paivio and Walsh make a number of suggestions about the way in which knowledge is represented in interacting visual and verbal modes – suggestions that relate to the role of imagery in metaphor. Coupled with these suggestions are some